REMARKS/ARGUMENTS

Claim 10 has been amended. Claims 1-14 are pending.

The Applicant appreciates the telephone message left by the Examiner on December 4, 2008, where the 35 U.S.C. 101 rejection was discussed and where the Examiner stated that the amendment to claim 10 was acceptable.

The Applicant also wishes to acknowledge the Form 1449 considered by the Examiner and showing a lined through reference. Since no explanation was offered as to why the reference was not considered, a duplicate copy of the original reference has been enclosed for your reconsideration. If this reference is still not in conformance, we kindly ask for an explanation as to why.

Claim Objections

The Office Action objected to claims 10-14 for failing to positively set forth a step of providing radiographic contrast agent to the blood. Claim 10 has been amended accordingly.

Claim rejections under 35 USC § 101

The Office Action rejected claims 10-14 under 35 U.S.C. 101 as being directed to non-statutory subject matter. The Office Action stated that the claims fail to provide a sufficient tie to another statutory class, such as an apparatus. Claim 10 has been amended accordingly.

Claim rejections under 35 USC § 102

The Office Action rejected claim 1 under 35 U.S.C. 102(b) as being anticipated by Gronberg et al. (US 4,573,181). The Office Action stated that Gronberg et al. discloses a method for measuring renal function as a component of x-ray fluorescence and CT analysis (col. 1, line 63, to col. 2, line 20) through analysis of the change in concentration of contrast agent through the kidney and associated vasculature (col. 1, line 63, to col. 2, line 60).

Gronberg does not disclose obtaining a CT number (CT_{PRE}) of arterial blood prior to the addition of a radiographic contrast agent to the blood, as recited in claim 1. In the cited section of Gronberg the phrase "computer tomography" is only used once, which is in col. 1, line 66. This single usage states that "computer tomography" may be used in conjunction with using the

temporal reduction in concentration to determine the excretion rate, and that this temporal reduction is measured by the X-ray fluorescence technology that is described as inventive by Gronberg. The X-ray fluorescence technology of Gronberg is not a CT that obtains a CT number of arterial blood prior to addition of a radiographic contrast agent. The office action failed to point out anything in Gronberg that specifically discloses or teaches obtaining a CT number of arterial blood prior to the addition of a radiographic contrast agent to the blood, as recited in claim 1.

It should be noted that Gronberg describes a fluorescence technique for measuring iodine in soft tissue. The patent describes making fluorescence measurements, which reflect the level of iodine. These measurements are not CT numbers. The CT number is proportional to the x-ray attenuation coefficient, and requires transmission x-ray techniques for its measurement. A CT scan is basically a two-dimensional matrix of CT numbers, which are proportional to x-ray attenuation. CT is a technique for transmitting x-rays through an object and detecting the x-rays on the other side, followed by a computation. When this is done appropriately, the transmitted x-ray intensities can be used to calculate two-dimensional maps of the x-ray attenuation, which are known as CT scans. The fluorescence technique of Gronberg is a qualitative way of measuring iodine concentrations in the soft tissues. This method is not a CT scanning, does not use CT numbers, and does not provide a two-dimensional image.

In addition, col. 1, line 63, to col. 2, line 1, of Gronberg states that the measurement is for the contrast agent in soft tissue. Such a measurement does not provide a measurement limited to arterial blood, which is different than soft tissue.

In addition, the office action failed to specifically point out anything in Gronberg that discloses or teaches obtaining a CT number (CT_A) of arterial blood after addition of the radiographic contrast agent to the blood and obtaining a CT number (CT_V) of blood in a renal vein after addition of the agent to the blood. At least for at least these reasons, claim 1 is not anticipated by Gronberg.

Claim rejections under 35 USC § 103

The Office Action rejected claims 2-14 under 35 U.S.C. 103(a) as being unpatentable over Gronberg et al. (US 4,573,181) in view of Unger. The Office Action stated that Gronberg

et al. discloses a method for measuring renal function as a component of x-ray fluorescence and CT analysis (col. 1, line 63, to col. 2, line 20) through analysis of the change in concentration of contrast agent through the kidney and associated vasculature (col. 1, line 63, to col. 2, line 60). The office action then cites Unger, col. 2, line 35, to col. 3, line 5, as teaching in detail renal function methods involving Gd-DTPA and the knowledge of iodine preparations for CT specific image analysis. The Office Action further stated that Unger discloses a method of blood-based analysis of contrast agent concentration through comparative analysis of blood before, during and after administration of the contrast agent, citing col. 12, line 60, to col. 13, line 53, and col. 50, line 65 to col. 51, line 25, and col. 51, lines 58-64, and col. 56, line 35, to col. 58, line 20 of Unger.

Claim 10, as amended, recites a) obtaining a measure of x-ray transmission through arterial blood prior to addition of a radiographic contrast agent to the blood, using the CT apparatus, b) providing a radiographic contrast agent to the blood, c)obtaining a measure of x-ray transmission through arterial blood after addition of the radiographic contrast agent to the blood, using the CT apparatus, d) obtaining a measure of x-ray transmission through renal vein blood after addition of the radiographic contrast agent to the blood, and e) determining renal extraction fraction from the measures of x-ray transmission in steps a), and c) , and d). This combination of steps is not made obvious by the cited references. The Office Action failed to specifically show anything in the references that teach determining renal extraction fraction from the measurement of x-ray transmission in steps of obtaining a measure of x-ray transmission through arterial blood prior to addition of radiographic contrast agent to the blood, obtaining a measure of x-ray transmission through arterial blood after addition of the radiographic contrast agent to the blood, and obtaining a measure of x-ray transmission through renal vein blood after addition of the radiographic contrast agent to the blood. The applicant's agent did not see anything in the citations by the Office Action that discloses or suggests measuring x-ray transmissions of arterial blood and measuring x-ray transmissions of renal vein blood and then using these measurements to determine renal extraction fraction. For at least these reasons, claim 10 as amended, is not made obvious by the cited references.

Claims 2-9 and 11-14 are ultimately dependent on the independent claims. In addition, these claims add additional features, which when taken together with the limitations of the independent claim are not anticipated or made obvious by the cited references. For example, claim 3 is dependent on claim 2 and further recites that renal extraction fraction (EF) is given by:

$EF = \frac{CT_A - CT_V}{CT_A - CT_{PRE}}$. The applicant's agent failed to see anything in the cited parts of the reference that taught this equation. For at least these reasons, claims 2-9 and 11-14 are not anticipated or made obvious by the cited references.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (408) 255-8001.

Respectfully submitted,
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